

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) A patch antenna including a dielectric substrate, a ground conductor formed on one main surface of the dielectric substrate, and a patch conductor formed on another main surface of said dielectric substrate, wherein

radiation efficiency is changed in a direction of wavelength-dependent length of said patch conductor, and wherein the patch antenna exhibits a radiation pattern which is asymmetric along the length of the antenna.

2. (Original) A patch antenna according to claim 1, wherein a spacing between said patch conductor and said ground conductor is made non-uniform in said direction of wavelength-dependent length.

3. (Original) A patch antenna according to claim 2, wherein thickness of said dielectric substrate is changed in said direction of wavelength-dependent length.

4. (Original) A patch antenna according to claim 1, wherein a dielectric constant is changed in said direction of wavelength-dependent length.

5. (Previously Presented) A patch antenna according to claim 1, wherein a dielectric is loaded on said patch conductor.

6. (Previously Presented) A cellular telephone with a patch antenna built-in according to claim 1, wherein

said cellular telephone includes a housing, and said patch antenna is arranged in such a manner that said direction of wavelength-dependent length matches the direction of thickness of said housing, and that a side thereof with higher radiation efficiency is faced opposite to a side of said housing making contact with head of a person.

7. (Previously Presented) A patch antenna according to claim 2, wherein a dielectric is loaded on said patch conductor.

8. (Previously Presented) A patch antenna according to claim 3, wherein a

dielectric is loaded on said patch conductor.

9. (Previously Presented) A patch antenna according to claim 4, wherein a dielectric is loaded on said patch conductor.

10. (Previously Presented) A cellular telephone with a patch antenna built-in according to claim 2, wherein

said cellular telephone includes a housing, and said patch antenna is arranged in such a manner that said direction of wavelength-dependent length matches the direction of thickness of said housing, and that a side thereof with higher radiation efficiency is faced opposite to a side of said housing making contact with head of a person.

11. (Previously Presented) A cellular telephone with a patch antenna built-in according to claim 3, wherein

said cellular telephone includes a housing, and said patch antenna is arranged in such a manner that said direction of wavelength-dependent length matches the direction of thickness of said housing, and that a side thereof with higher radiation efficiency is faced opposite to a side of said housing making contact with head of a person.

12. (Previously Presented) A cellular telephone with a patch antenna built-in according to claim 4, wherein

said cellular telephone includes a housing, and said patch antenna is arranged in such a manner that said direction of wavelength-dependent length matches the direction of thickness of said housing, and that a side thereof with higher radiation efficiency is faced opposite to a side of said housing making contact with head of a person.

13. (Previously Presented) A cellular telephone with a patch antenna built-in according to claim 5, wherein

said cellular telephone includes a housing, and said patch antenna is arranged in such a manner that said direction of wavelength-dependent length matches the direction of thickness of said housing, and that a side thereof with higher radiation efficiency is faced

opposite to a side of said housing making contact with head of a person.

14. (New) A patch antenna according to claim 1, wherein said dielectric substrate is a single dielectric substrate having a uniform dielectric constant.

15. (New) A patch antenna, which comprises:

a dielectric substrate having a first surface and a second surface situated opposite the first surface, and further having a first thickness and a second thickness situated adjacent the first thickness, and an abrupt step in thickness situated between the first thickness and the second thickness, the first thickness being different from the second thickness;

a patch conductor situated in proximity to the first surface of the dielectric substrate, the patch conductor having a first end and a second end situated opposite the first end, and further having a center situated equidistantly between the first end and the second end; and

a ground conductor situated in proximity to the second surface of the dielectric substrate, whereby the dielectric substrate is interposed between the patch conductor and the ground conductor;

wherein the abrupt step in thickness is situated in alignment with the patch conductor between the first end and the second end of the patch conductor and offset from and in non-alignment with the center of the patch conductor;

and wherein the patch antenna exhibits a radiation pattern which is asymmetric along the length of the antenna due to the abrupt step in thickness of the dielectric substrate.

16. (New) A patch antenna, which comprises:

a dielectric substrate having a first surface and a second surface situated opposite the first surface;

a patch conductor situated in proximity to the first surface of the dielectric substrate, the patch conductor having a first end and a second end situated opposite the first end, and further having a center situated equidistantly between the first end and the second end; and

a ground conductor situated in proximity to the second surface of the dielectric substrate, whereby the dielectric substrate is interposed between the patch conductor and the ground conductor;

wherein the patch conductor and the ground conductor are separated from each other by a first spacing and a second spacing situated adjacent the first spacing, and an abrupt change in spacing situated between the first spacing and the second spacing, the abrupt change in spacing being situated in alignment with the patch conductor between the first end and the second end of the patch conductor and offset from and in non-alignment with the center of the patch conductor;

and wherein the patch antenna exhibits a radiation pattern which is asymmetric along the length of the antenna due to the abrupt change in spacing between the patch conductor and the ground conductor.